Continued efforts are undertaken to develop animal models of schizophrenia with translational value in the quest for much needed novel drugs. Existing models mimic specific neurobiological aspects of schizophrenia, but not its full complexity. Here, we used proton magnetic resonance spectroscopy ($^{1}$H-MRS) to assess the metabolic profile in the prefrontal cortex (PFC) of two established models, rearing in social isolation and acute N-methyl-d-aspartate receptor (NMDA-R) antagonism and their combination. Rats reared in social isolation or group housed underwent (1)H-MRS at baseline and dynamically after ketamine challenge (25mg/kg, intraperitoneal) under isoflurane anesthesia. A 7 T animal scanner was used to perform spectra acquisition from the anterior cingulate/medial PFC. LCModel was used for metabolite quantification and effects of rearing and ketamine injection were analyzed. Social isolation did not lead to significant differences in the metabolic profile of the PFC at baseline. Ketamine induced a significant increase in glutamine in both groups with significance specifically reached by the group-housed animals alone. Only rats reared in social isolation showed a significant 11% ?-aminobutyric acid (GABA) decrease. This study provides preliminary evidence that social
interactions in early life predict the glutamatergic and GABAergic response to acute NMDA-R blockade. The similarity between the prefrontal GABA reduction in patients with schizophrenia and in rats reared as social isolates after challenge with ketamine suggests good potential translational value of this combined animal model for drug development.

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